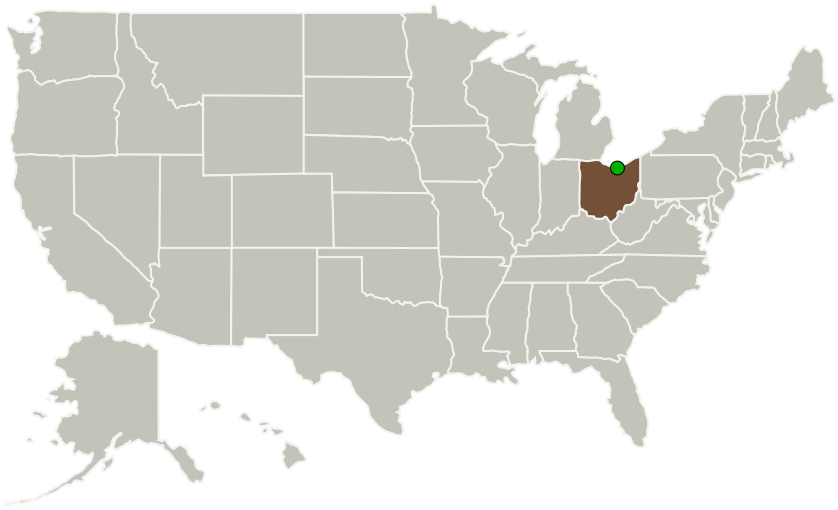
UAS Power Amplifier for Extended Range of Non-Payload Communication Devices (UPEND), Phase I

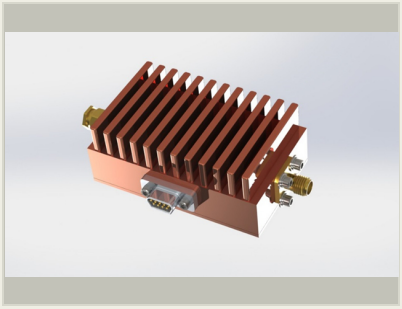
Completed Technology Project (2014 - 2014)

Project Introduction

The integration of Unmanned Aircraft Systems (UAS) into the National Airspace System (NAS) requires a robust, reliable communication link between the Unmanned Aerial Vehicle (UAV) and its operators. Constant communication is a necessity. New and innovative approaches are needed to provide high-bandwidth Control and Non-Payload Communications (CNPC). To enable the CNPC system and increase the utility of UAS in the NAS, NuWaves Engineering has teamed up with Auriga Microwave (http://www.aurigamicrowave.com/) of Chelmsford, MA to propose the UAS Power amplifier for Extended range of Non-payload communication Devices (UPEND) project. UPEND combines a very high-efficiency radio frequency (RF) power amplifier (PA) with innovative linearization techniques in a miniature package capable of being integrated into UAS platforms as small as the venerable Boeing/Insitu ScanEagle. NuWaves' UPEND leverages advanced Monolithic Microwave Integrated Circuit (MMIC) technology, as well as efficiency and thermal design, to minimize size, weight, and power (SWaP) of a PA module, while maintaining the linear output required by complex modern communications waveforms, such as 802.16.

Primary U.S. Work Locations and Key Partners





UAS Power amplifier for Extended range of Non-payload communication Devices (UPEND) Project Image

Table of Contents

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Organizations Performing Work	Role	Type	Location
Nu Waves Ltd.	Lead Organization	Industry	Middletown, Ohio
Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations
Ohio

Project Transitions

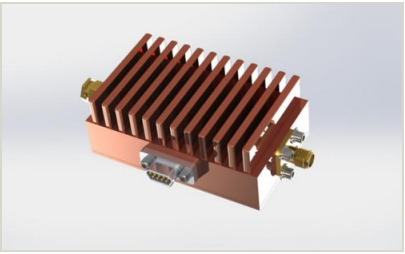
June 2014: Project Start

December 2014: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/138593)*

Images



Project Image
UAS Power amplifier for Extended range of Non-payload communication Devices (UPEND) Project Image
(https://techport.nasa.gov/image/128367)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Nu Waves Ltd.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Tim Wurth

Co-Investigator:
Timothy Wurth

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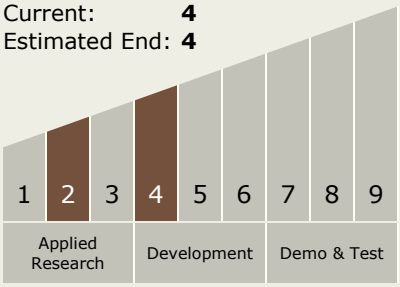
Technology Maturity (TRL)

Start: **2**
Current: **4**
Estimated End: **4**



Technology Areas

Primary:

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
  - TX05.2 Radio Frequency
    - TX05.2.4 Flight and Ground Systems

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System